



NORTH DAKOTA PUBLIC SERVICE COMMISSION

CONSOLIDATED APPLICATION OF
VANTAGE PIPELINE US LP

for

CERTIFICATE OF CORRIDOR COMPATIBILITY AND ROUTE PERMIT

Vantage Pipeline Project

PSC Case No. PU-11-109

February 2012

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Acronyms Used in this Application

ACOE	U.S. Army Corps of Engineers
BMP	Best Management Practice
bpd	barrels per day
DoS	U.S. Department of State
DOT	U.S. Department of Transportation
EPA	Environmental Protection Agency
EPP	Environmental Protection Plan
ER	Environmental Report
HVP	High Vapor Pressure
mmcf/d	million cubic feet per day
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
ND	North Dakota
NDDH	North Dakota Department of Health
NDFG	North Dakota Fish & Game Department
NDSHPO	State Historic Preservation Office
NRHP	National Register of Historic Places
PHMSA	Pipeline and Hazardous Materials Safety Administration
psi	pounds per square inch
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

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SECTION A: DESCRIPTION OF PROPOSED FACILITY

A.1. DESCRIBE THE TYPE OF FACILITY ADDRESSED IN THIS APPLICATION. THE DESCRIPTION SHALL INCLUDE THE PURPOSE OF THE FACILITY AND THE TECHNOLOGY TO BE EMPLOYED.

Vantage Pipeline US LP is proposing to construct and operate approximately 430 miles of new, high vapor pressure (HVP) steel pipeline and two pump stations to transport ethane from a natural gas processing plant near Tioga, North Dakota to an existing pipeline system near Empress, Alberta, which currently transports ethane to the Alberta petrochemical industry. The proposed pipeline would include the construction of approximately 79.8 miles of new 10-inch diameter pipeline in North Dakota; approximately 350 miles in Saskatchewan, Canada; and approximately 2 miles in Alberta, Canada. One pump station would be located at the midpoint of the pipeline between Lafleche and Assiniboia, Saskatchewan. The second pump station would be located at the terminus near Empress, Alberta. The general location of the project is shown on Figure A-1. No pump stations are located in North Dakota.

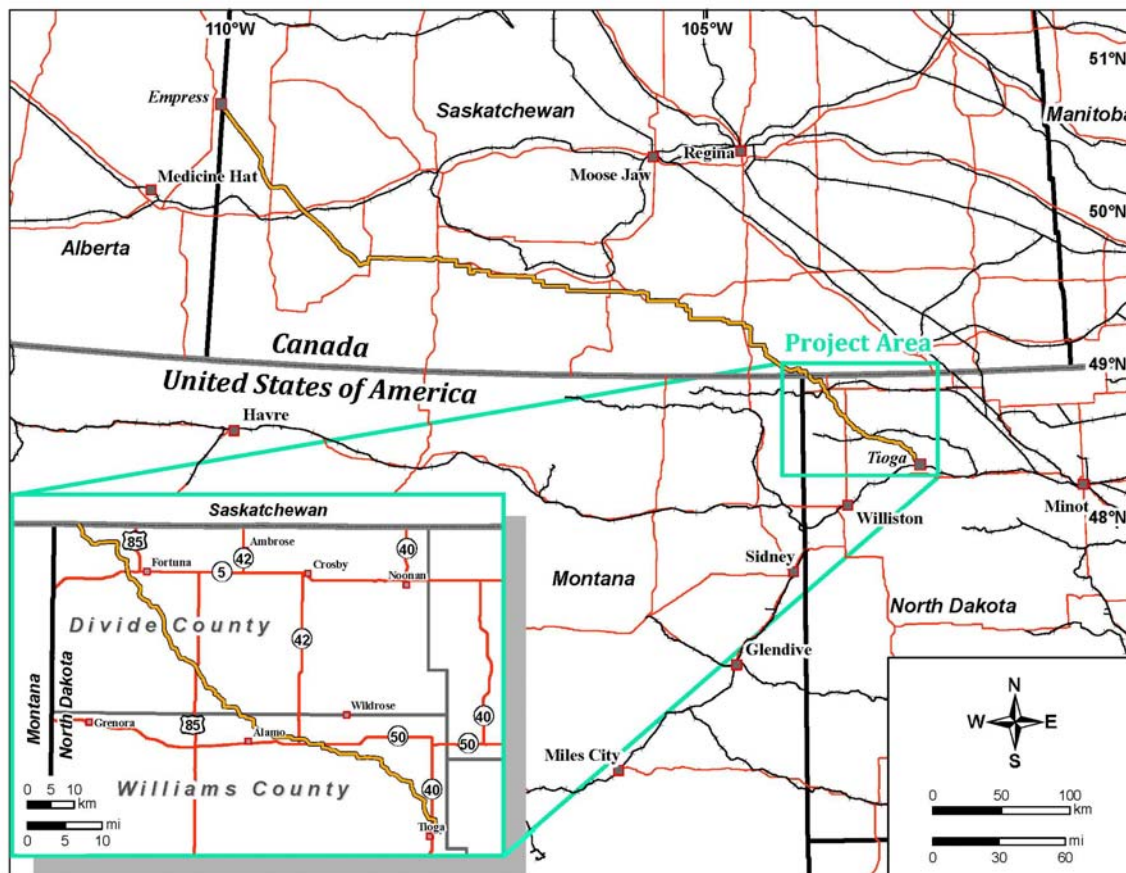


Figure A-1. Project Area Location

Natural gas production in North Dakota is now at a level that makes it economically feasible to extract ethane from the natural gas and sell it to ethane consumers. The purpose of the Vantage Pipeline is to efficiently transport increasing liquid ethane supplies from existing natural gas facilities in the Williston

Basin to meet the market demand created by the petrochemical industry in Alberta, Canada, which has demonstrated interest in purchasing these increased supplies. Vantage has entered into a long-term agreement with Hess Corporation (Hess) and NOVA Chemicals Corporation (NOVA) to transport ethane from Hess' Tioga Gas Plant to an existing ethane pipeline system near Empress, Alberta, Canada. From this point the ethane would be transported on existing pipeline infrastructure to NOVA's Joffre Petrochemical Complex in Joffre, Alberta.

A.2. DESCRIBE THE TYPE, SOURCE, AND FINAL DESTINATION OF THE PRODUCT TO BE TRANSMITTED BY THE PROPOSED FACILITY.

A.2.1. Type

The proposed Vantage Pipeline will transport liquid ethane, a component of natural gas. Ethane is used as a feedstock for the world-scale petrochemical facilities located in the province of Alberta where it is converted to ethylene. In Alberta, NOVA's Joffre Petrochemical Complex will convert the ethane to ethylene, which is a building block for a wide range of consumer and industrial products such as plastics, antifreeze, rubber, detergents, and solvents.

A.2.2. Source

The primary source of supply for the ethane is the Hess Corporation's Tioga Gas Plant located in the Williston Basin of northwestern North Dakota. The pipeline has spare capacity and additional ethane producers may be added in the future.

A.2.3 Final Destination

The Vantage Pipeline would transport ethane to an existing pipeline, the Alberta Ethane Gathering System (AEGS), south of Empress, Alberta, Canada (Figure A-2). AEGS would transport the ethane to NOVA's Joffre Petrochemical Complex.

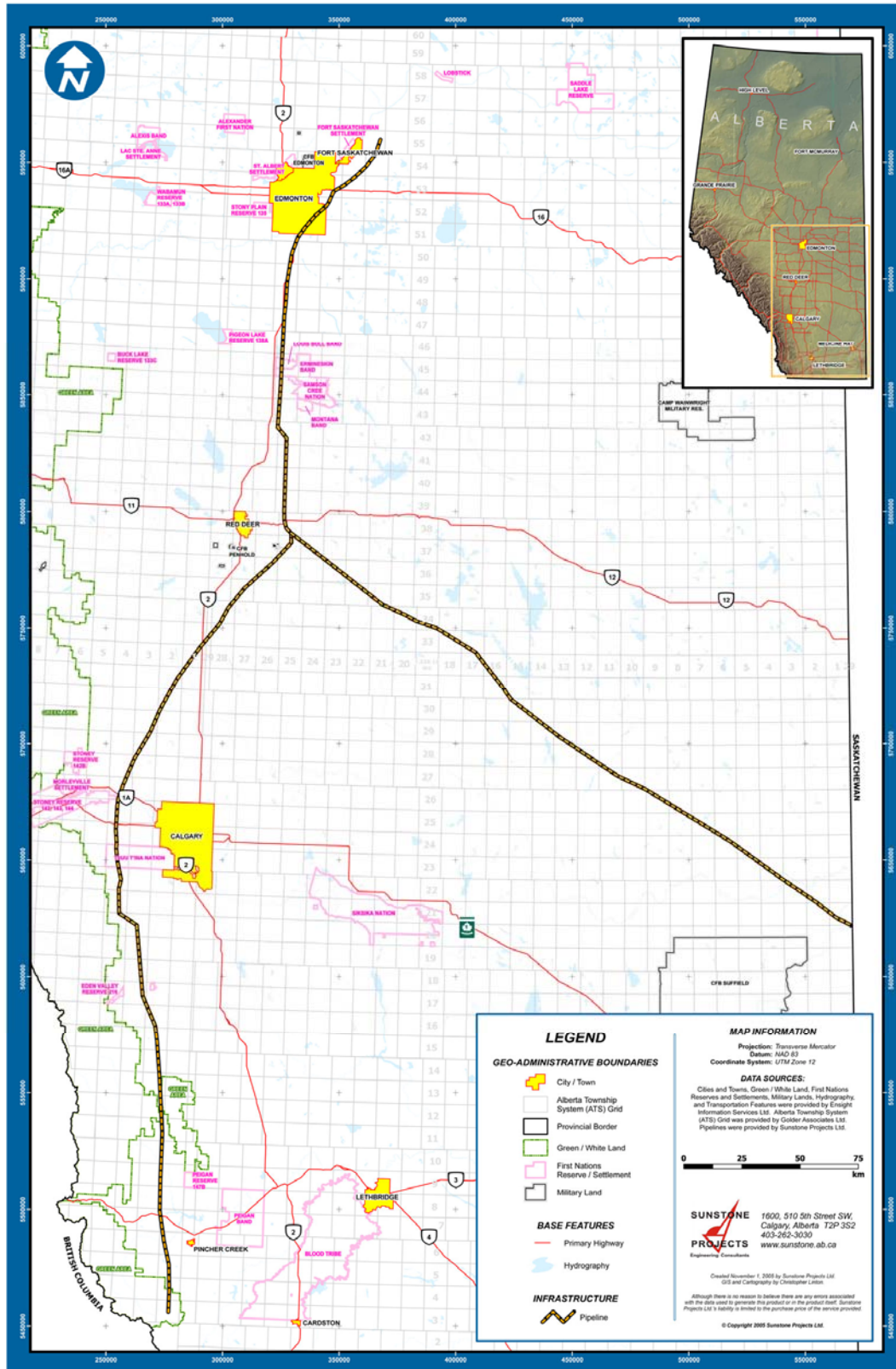


Figure A-2: Alberta Ethane Gathering System

A.3. SIZE AND DESIGN

A.3.a. Provide a description of the size and design of the pipeline facility.

A.3.a.(1) Width of right-of-way

Following construction, Vantage would generally maintain a 30-foot-wide permanent right-of-way for operations and maintenance. A total of 79.8 miles of new right-of-way would be needed for construction within North Dakota.

Construction of the pipeline would generally require a 70-foot-wide right-of-way, which is made up of 30 feet of permanent right-of-way and 40 feet of temporary work space, to allow for temporary storage of topsoil and spoil and to accommodate safe operation of construction equipment.

During construction, Vantage would temporarily use off-right-of-way areas for pipe and materials storage. In addition, construction contractors would require off-right-of-way areas to park equipment and stage construction activities.

Public roads would typically be used to gain access to the construction right-of-way. In areas where public roads are limited, existing privately owned roads may be used to provide access to the construction right-of-way. If neither public nor privately owned roads are available, construction access would be obtained through the temporary right-of-way. Permanent access to block valve locations would require roadways constructed from existing public and private roads. The length of permanent access roads are minimized by locating the block valves close to existing roads the permanent access roads. Use of private access roads, modifications to existing non-private roads, and construction of any new access roads would require obtaining landowner permission, local county permission and environmental surveys prior to use.

A.3.a.(2) Estimated span lengths between surface structures

Eight above-ground mainline block valves would be located approximately 15 miles apart along the pipeline route in North Dakota. Mainline valves would be installed at these locations to facilitate system operations.

Installation of the mainline valve sites would be accommodated within the permanent and temporary workspace obtained for the pipeline construction. The valve sites would be fenced. The valve sites are located next to existing roads; therefore, access to most of the valve sites for pipeline operations would be by short new permanent access roads off the main road.

A.3.a.(3) Pipe size

The Vantage Pipeline will consist of 10-inch diameter underground HVP steel pipe.

A.3.a.(4) Approximate length of facility

Vantage proposes to construct and operate 79.8 miles of pipeline from the Hess Plant in Tioga, North Dakota to an international border crossing near Fortuna, North Dakota.

Ownership of land crossed by the Vantage Pipeline route is identified in Table A-1.

LAND TYPE/LOCATION	CROSSING LENGTH (MILES)	PERCENTAGE OF ROUTE
Federal lands	0.0	0.0
State lands	1.0	1.3
County lands	0.0	0.0
Incorporated areas (Tioga)	0.0	0.0
Private land outside incorporated areas	78.8	98.7
Total	79.8	100.0

A.3.a.(5) Maximum design operating pressure and temperature

The steel pipeline will be in HVP service with a maximum operating pressure of 1,440 pounds per square inch (psi); normal operating pressures will be less than 1,440 psi. Operating temperatures adjacent to the Tioga plant will range from 40 to 120 degrees Fahrenheit. The majority of the pipeline, which extends from one mile away from the Tioga gas plant to the U.S./Canada border, will operate between 25 and 45 degrees Fahrenheit.

A.3.a.(6) Maximum flow rate

The maximum design flow rate is 40,000 barrels per day, expandable to 60,000 barrels per day with the addition of two pump stations. This expansion capability would accommodate future ethane supply from other Williston Basin producers. If expanded, the additional pump stations would be located in Canada.

A.3.b.(7) Number and general location of above-ground facilities

Above-ground facilities for the Vantage Pipeline in North Dakota include:

- an internal inspection launcher located in the HESS Tioga Plant Site,
- a custody transfer meter station in the HESS Tioga Plant site before the ethane enters the pipeline, and
- eight above-ground mainline block valves (Figure A-3).

Exhibit 6: Route Map illustrates proposed block valve locations along the route.

One additional custody transfer meter station will be located at the interconnect with the AEGS near Empress, Alberta. A pipeline internal inspection receiver will be located at the AEGS interconnection near Empress, Alberta. A total of two pumping stations will be constructed for the Vantage Pipeline, both in Canada: one at the midpoint of the pipeline between Lafleche and Assiniboia, Saskatchewan; and a second near Empress, Alberta.

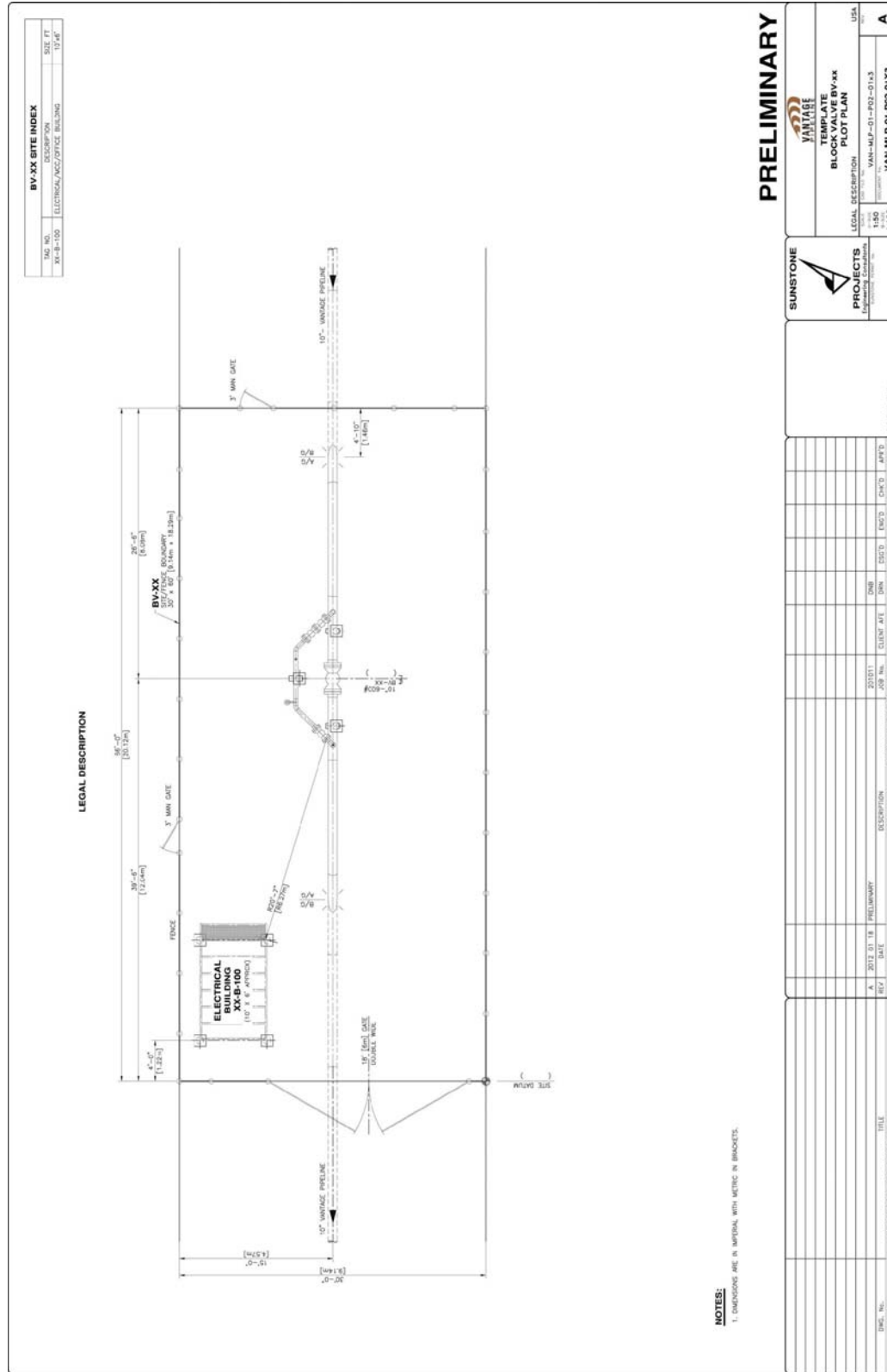


Figure A-3. Typical Block Valve

PRELIMINARY

		 VANTAGE PIPELINE US LP BLOCK VALVE AT BV-XX PLOT PLAN		LEGAL DESCRIPTION 1.50 1.100	USA A
JOB NO. 20111 DATE 2012.01.18 PRELIMINARY		CLIENT AT: DMB DATE: 2012.01.18		PROJECT NO. VAN-MLP-01-P02-01.1.3 DRAWING NO. VAN-MLP-01-P02-01.X3	
REV. A DATE 2012.01.18 PRELIMINARY		DESCRIPTION BLOCK VALVE AT BV-XX		DRAWING REVISIONS	
REFERENCE DRAWINGS		TITLE		DATE	

A.4. TIME SCHEDULE

A.4.a. Certificate of Corridor Compatibility

Vantage respectfully requests its certificate approval from the North Dakota Public Service Commission in the second quarter of 2012.

A.4.b. Route Application

A route application will be submitted by Vantage by the beginning of the first quarter of 2012.

A.4.c. Route permit

Vantage respectfully requests its certificate approval from the North Dakota Public Service Commission in the second quarter of 2012.

A.4.d. Construction Start Date

The proposed construction start date is immediately upon receipt of appropriate approvals. The expected construction start date is between the end of the second quarter and the beginning of the third quarter of 2012.

A.4.e. In-service date

Vantage estimates the in-service date to be in the second quarter of 2013.

SECTION B: STUDIES

Vantage consulted with federal, state, and local agencies to identify environmental resources in the project area and determine what environmental studies would be required. An Environmental Report (ER) was prepared and submitted by Vantage to the U.S. Department of State (DoS) in support of an application for a Presidential Permit for the portion of the project located in North Dakota. The ER is attached to this Application as Exhibit 1. Note that the ER was prepared by Vantage only to assist DoS with the preparation of its own Environmental Assessment for the Vantage Pipeline, and is not the Draft EA which will be formally issued by DoS. Table B-1 provides a list of surveys and assessments conducted in connection with this project, and attached as exhibits to this application. Results of these surveys and assessments are summarized in the ER.

Table B-1. Surveys and Assessments		
RESOURCE	DATE	EXHIBIT NO.
• Class I and Class III Cultural Resources Surveys	August 2010 – November 2011	2
• Wetlands and Riparian Zones	July 2010 – November 2011	3
• Fish and Wildlife	April 2011 - May 2011	4
• Threatened, Endangered, Candidate, and Sensitive Animal and Plant Species	April 2011 – July 2012	5

Following is a summary of meetings and phone calls with federal, state, and county agencies contacted during preparation of the Presidential Permit application and environmental review.

In June of 2010 an information package was sent to the Environmental Protection Agency (EPA) and a follow-up phone call was made to answer any questions regarding the project. In September 2010, a meeting was held between Vantage and the Pipeline and Hazardous Materials Safety Administration (PHMSA). A project review was provided and a number of questions regarding the design of the pipeline were answered.

An initial meeting was also held between the DoS and Vantage in June, 2010 to discuss Vantage’s plans and DoS involvement, as well as the environmental review process being undertaken by DoS. Further follow-up meetings and phone calls were undertaken to keep the DoS apprised of the project. On December 5, 2011, Vantage, DoS, and Merjent, Inc. (Merjent) entered into a Memorandum of Understanding (MOU) under which Merjent will act as the third-party contractor to assist DoS in preparing environmental documents consistent with the National Environmental Policy Act (NEPA). DoS, together with Merjent, are currently in the process of preparing a Draft EA for the Vantage Pipeline prior to DoS issuing a Presidential Permit and Record of Decision/National Interest Determination. Coordination with DoS and Merjent continues throughout the development of the EA.

A meeting was held between Vantage, U.S. Army Corps of Engineers (ACOE), North Dakota State Historic Preservation Office (NDSHPO), U.S. Fish and Wildlife Service (USFWS), ND Department of Health (NDDH), ND Game and Fish and ND State Water Commission in August, 2010 to review the project and receive initial feedback regarding the proposed pipeline route and any known environmental concerns along the proposed route. A follow-up meeting was held with ACOE, USFWS, ND Department of Health, and the ND Office of the State Engineer in December 2010 to review findings of the environmental surveys along the proposed pipeline route that were completed in the 3rd and 4th quarters of

2010. Project updates and correspondence with USFWS and SHPO has continued throughout the development of this project.

Further, Native American tribal resources may be affected by the construction and/or operation of the Vantage Pipeline. Representatives of the Fort Peck Tribes or the Three Affiliated Tribes accompanied archaeologists during cultural resource inventories of the pipeline and aided in the identification and recording of sites and features with religious and cultural significance. The DoS has begun consultations with Tribal Historic Preservation Officers (THPO) of affected Tribes pursuant to Section 106 of the National Historic Preservation Act in order to take into account the presence or absence of Traditional Cultural Properties of religious and/or cultural significance.

Stakeholder meetings were held in Tioga and Fortuna, North Dakota. Results of the stakeholder and agency meetings are summarized in Table B-2.

Table B-2. Summary of Issues Identified During Preliminary Stakeholder Review		
ISSUE/ENTITY	LETTER/ MEETING DATE	COMMENTS
AGENCY COORDINATION U.S. Fish & Wildlife Service (USFWS), U.S. Army Corps of Engineers, State Historical Society of North Dakota	August 1, 2010	Coordinate with USFWS on the following: <ul style="list-style-type: none"> • Known locations of piping plover critical habitat. • Available protective measures for Aransas Wood Buffalo Population of whooping cranes. • Potential habitat for Sprague's pipit. • Avoid all property interests within the National Wildlife System, when possible, during construction. • Obtain Special Use or right-of-way permits for construction affecting property interests administered by USFWS. • Coordinate with the Zone Archeologist regarding cultural resources. • Coordinate with USFWS and the Army Corps of Engineers if a 404 permit is required.
North Dakota Game & Fish Department	August 4, 2010 July 19, 2011	<ul style="list-style-type: none"> • Contact NDG&F if the route crosses land enrolled in the access program to determine if there will be any payment deductions due to the pipeline construction. • Inform NDG&F if there are any significant changes to the alignment. • For areas within ¼ mile of a sharp-tailed grouse active ground, construction should not occur March 1 through May 15. Construction activities should not occur until 2 hours after official sunrise.
North Dakota Department of Health (NDDH)	August 1, 2010	<ul style="list-style-type: none"> • A construction storm water permit (NDR10-0000) from the NDDH will be required and Vantage would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP). • A Temporary Dewatering and Hydrostatic Testing permit (NDG07-0000) would be required from the NDDH for construction dewatering and discharge from hydrostatic testing.

Table B-2. Summary of Issues Identified During Preliminary Stakeholder Review

ISSUE/ENTITY	LETTER/ MEETING DATE	COMMENTS
USFWS	August 1, 2010	<ul style="list-style-type: none"> • Avoid documented and potential nesting wetlands for piping plover from April 1 through September 1. • Maintain a one-half mile no-entry buffer around all shorelines during construction, which may entail rerouting the pipeline if nesting season cannot be avoided; and • Avoid all vehicle use on any wetland shoreline, including a 200-foot buffer, in the project area. • Cease construction and immediately contact the USFWS if a whooping crane is sighted within one mile of a pipeline or associated facilities during construction. • Maintain a one-half-mile buffer around golden and bald eagle nests. • To the extent practicable, schedule construction for late summer or fall/early winter so as not to disrupt waterfowl or other wildlife during breeding season (February 1 to July 15). • Provide a detailed plan to avoid or mitigate for unavoidable impacts to wetlands. • Make no stream channel alterations or changes in drainage patterns. • Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels.
	December 7, 2010	<ul style="list-style-type: none"> • Avoid construction during periods when ground nesting species are present within construction right-of-way. Habitat modifications may be considered. Surveys should be performed prior to construction disturbance. • USFWS would review the route within wetland easements during the spring of 2011.
	February 3, 2011	<ul style="list-style-type: none"> • USFWS reviewed species sections of draft EA, finding the timing restrictions and buffer zones to be adequate. • USFWS recommended additional measures to avoid impacts to migratory birds, including: conducting surveys if construction occurs from February 1 to July 15; and if nests and/or birds are discovered within the construction area, to consult with the USFWS prior to construction in that area.
	August, 2011	<ul style="list-style-type: none"> • Ongoing informal Section 7 Consultation with the USFWS regarding the results of any surveys will continue. • If piping plover nesting is present within a 0.5 mile radius of the proposed project, all construction activities will cease or will not be implemented within that radius until the birds are done utilizing those breeding habitats.

Table B-2. Summary of Issues Identified During Preliminary Stakeholder Review

ISSUE/ENTITY	LETTER/ MEETING DATE	COMMENTS
North Dakota Game & Fish	August 4, 2010	<ul style="list-style-type: none"> • Avoid crossing streams from April 15 to June 1 and ensure that erosion control BMPs are in place during the construction.
North Dakota State Water Commission	December 7, 2010	<ul style="list-style-type: none"> • Construction of the pipeline should not result in drainage of wetlands or other waterbodies. North Dakota Century Code, Chapter 61-32 – Wetlands addresses rules related to drainage of wetlands. • A Conditional Water Permit or Temporary Water Permit would be required for appropriation of surface or ground water for use in hydrostatic testing.
U.S. Department of Agriculture (USDA) North Dakota State office and USDA Farm Service Association	August 13, 2010 August 31, 2010	<ul style="list-style-type: none"> • Provided pipeline routing maps to USDA personnel and inquired regarding existence of parcels enrolled in conservation programs along proposed alignment.
USFWS	August 1, 2010	<p>Reseed disturbed areas with a mixture of native grass and forb species immediately after construction to reduce erosion.</p> <p>If trenching is performed in grassland habitat, complete post-construction reseeding of native prairie grasses, forbs, and legumes. Planting of diverse species is encouraged.</p>
Landowners along the pipeline route, Tioga and Fortuna, SD	March 22 and 23, 2011	<p>Provided overview of projects. Concerns addressed include:</p> <ul style="list-style-type: none"> • Driving over pipeline • Pipeline integrity • Compensation • Land reclamation • Radius of pipeline bends • Fencing over pipeline • Fencing for cattle during construction and reclamation • Temperature of pipe and product • Depth of pipeline • Will above-ground block valves need power? • Will locator signs be installed?

SECTION C: NEED FOR FACILITY

C.1. AN ANALYSIS OF THE NEED FOR THE PROPOSED FACILITY BASED ON PRESENT AND PROJECTED DEMAND FOR THE PRODUCT TRANSMITTED BY THE FACILITY, INCLUDING THE MOST RECENT SYSTEM STUDIES SUPPORTING THE ANALYSIS OF THE NEED.

This section provides an overview of the ethane supply and demand in Alberta, as well as a description of the ethane available in North Dakota for transportation by the Vantage Pipeline. A detailed analysis of ethane supply and demand related to the Vantage Pipeline is provided in a report entitled, “Ethane Supply and Demand for the Vantage Pipeline” prepared by Purvin & Gertz, Inc. and is included as Appendix C to the ER (Exhibit 1) for this project.

C.1.a. Alberta Ethane Supply

The production of ethane in Alberta is directly related to natural gas production and exports from the province. Traditionally, the majority of the ethane has been recovered through gas processing in Alberta which processes natural gas exports. All economically available ethane in Alberta is being recovered from the existing gas supply.

Gas-directed drilling has declined sharply in Alberta and throughout western Canada in recent years, largely as a result of low prices and high costs. The development of unconventional gas resources in North America has also been a significant contributing factor to the decline in gas-directed drilling in western Canada. As a result, exports of natural gas from Alberta and western Canada have declined. Ongoing decline of the gas supply coupled with an increase in Alberta demand is expected to further reduce gas exports.

As natural gas supply and exports from Alberta have dropped, ethane supply within Alberta has also fallen. A shortfall exists between the Alberta petrochemical demand and what the western Canadian ethane market can supply. While additional ethane supply is potentially available in Alberta, significant new investments in gas processing and natural gas liquids (NGL) infrastructure would be required. In spite of available incentives, no large incremental ethane supply projects have been developed to address the supply shortfall. This is a strong indication that the costs associated with recovering incremental ethane supply in Alberta are so high that they are currently uneconomic to produce. Therefore, the shortfall in Alberta is expected to grow and continue for the foreseeable future.

C.1.b. Alberta Ethane Demand

Petrochemical consumption in Alberta is the primary driver of ethane demand in Western Canada. Virtually all of the ethane produced in Western Canada is consumed by the Alberta petrochemical industry. There are two large petrochemical production complexes, one operated by Dow Chemical Canada LLC (Dow) in Fort Saskatchewan, and the other operated by NOVA in Joffre. There was a significant increase in ethane demand with the expansion of the Dow facility in 1999 and the NOVA facility in 2000.

Forecasts show that potential ethane demand would exceed ethane supply in Western Canada, and that the Alberta petrochemical industry would continue to consume all available ethane over the next 15 years. Current petrochemical consumption in Alberta is approximately 215,000 barrels per day (bpd). The nameplate ethane consumption capacity of the Alberta petrochemical industry is approximately 250,000 bpd. As a result, the petrochemical facilities are approximately 35,000 bpd short of the volume of ethane needed to operate at full capacity. Forecasts show that this shortfall will continue to grow. It is expected

that the western Canadian petrochemical industry will be faced with a shortfall of greater than 76,000 bpd of ethane by 2014.

C.1.c. North Dakota Ethane Supply

The Williston Basin, which covers parts of western North Dakota, eastern Montana, and parts of Saskatchewan and Manitoba, is primarily an oil play that is estimated to contain several hundred billion barrels of oil. Of the estimated oil in place, approximately 4 billion barrels of oil are considered recoverable with existing technology.

The Williston Basin has seen rapid production increases in recent years due largely to high oil prices and technological improvements, such as horizontal drilling and multistage fracturing. The Bakken geological formation has been the most significant target of Williston Basin exploration activity, although producers are now also looking at the Three Forks formation for production. Associated gas production has increased coincident with the oil production, and this associated gas has high ethane content (typically in excess of 20 percent ethane). Virtually all of the ethane produced with natural gas is currently left in the gas stream.

In 2009, oil production in North Dakota was approximately 220,000 bpd, compared to only 80,000 bpd in 2003. North Dakota natural gas production was relatively flat at 150 million cubic feet per day (mmcf) from 2000 through 2005. From early 2006 to late 2010, gas production has more than doubled to approximately 340 mmcf. A number of producers have significant development plans in the prime areas for production growth in northwestern North Dakota, in the counties of Mountrail, Williams, and McKenzie.

The recovery and sale of specification ethane provides an additional source of revenue to Bakken producers. Estimates suggest that there will be approximately 40,000 to 45,000 bpd of ethane initially available for transportation through the Vantage Pipeline.

Further, several new gas plants or gas plant expansions have been announced for North Dakota. The largest expansion is at the Hess plant near Tioga, ND. The Tioga plant is currently the largest and oldest natural gas processing plant in the state of North Dakota. The expansion will more than double the current capacity of the Tioga plant to exceed 250 mmcf of natural gas. In addition to the plant expansion, Hess plans to construct a 120,000 bpd oil and natural gas liquid rail loading terminal. Construction of both the plant expansion and rail loading terminal has commenced and these facilities are expected to be in service by the second quarter of 2013. In addition to the gas plant, gas gathering, and railcar terminal expansion, Hess has announced production expenditures of approximately \$3.1 billion in the Bakken oil shale where Hess plans to operate 15 rigs.

The Hess plant at Tioga is the initial ethane supply source for transport of approximately 30,000 bpd to Canada via the Vantage Pipeline. The Vantage Pipeline may in the future also transport ethane produced from other North Dakota-area natural gas producers. Cumulative impacts associated with the Hess plant expansion are addressed in Sections 5.2 – 5.7 of the ER (Exhibit 1).

C.1.d. Shipper Demand for Transportation Service

Vantage has negotiated a binding commitment with NOVA for transportation service on the Vantage Pipeline. The transportation service agreement entered into with NOVA commits capacity on the Vantage Pipeline to NOVA for ethane purchased directly from and originating at Hess's natural gas plant located in Tioga, North Dakota. Ethane transportation service under this agreement is scheduled to commence in

the second quarter of 2013, with initial contract service quantities escalating to approximately 30,000 bpd by the calendar year 2015. The term of the agreement is 10 years, with options for two 5-year extensions.

In addition, in a news release dated July 15, 2010, NOVA announced an MOU with Hess to purchase 100 percent of the ethane produced at the Hess Tioga gas plant under a long term arrangement. The Vantage Pipeline fills a need for liquid ethane transportation service from the growing supply regions of North Dakota and Saskatchewan, to supply the ethane constrained market in Alberta. There are and will be adequate markets to support the long-term utilization of the Vantage Pipeline.

As the maximum capacity of the 10-inch Vantage Pipeline is 60,000 bpd, NOVA Chemicals' transportation commitment represents approximately 50 percent of the capacity available for shippers. Uncommitted capacity would be marketed and made available to qualified shippers through the ongoing business development efforts of Vantage. Primary qualifications for shippers include creditworthiness, along with confirmation of supply at an approved receipt point and an AEGS offtake arrangement at the delivery end of the Vantage Pipeline.

C.1.e. Future Expansion

The addition of two pump stations in Canada would provide the ability to further compress the ethane and expand the pipeline capacity to 60,000 bpd.

C.2. A DESCRIPTION OF ANY FEASIBLE ALTERNATIVE METHODS OF SERVING THE NEED

No other pipelines currently exist in the area to transport ethane to markets located in Alberta. High-pressure ethane cannot be transported via rail or truck.

SECTION D: LOCATION

D.1 STUDY AREA

The pipeline study area consisted of possible route locations within the Williams and Divide County boundaries of North Dakota, between Hess Corporation's natural gas plant in Tioga, ND and the United States-Canada border crossing location approximately 12.2 miles northwest of Fortuna, North Dakota and approximately 9.3 miles south of Beaubier, Saskatchewan. Vantage initially defined its study area as the general area centered on the proposed pipeline route within Williams and Divide Counties. Section 69-06-04-02.1.b of the North Dakota Administrative Code requires that the width of the study area for the proposed pipeline be at least 10 percent of its length, but not less than 1 mile and not greater than 6 miles. At approximately 79.8 miles in length within the state of North Dakota, 10 percent would be an 8.0-mile-wide study area. Therefore, the maximum 6-mile-wide study area applies. Vantage compiled and reviewed data for land ownership, land cover type, soils, surface water, and wetlands within the study area, as a basis for developing route alternatives within the study area. The criteria used to evaluate the proposed route are described in Sections B.3 through B.4 of the Route Permit portion of this consolidated application.

Following study area selection, several options for the location of the 500-foot survey corridor were considered and a final survey corridor was selected based on the avoidance of adverse environmental effects that could result from pipeline right-of-way preparation, construction, operation, and maintenance. Surveys for biological resources were conducted within this 500-foot survey corridor. Surveys for cultural resources were conducted within a 300-foot survey corridor, as discussed in Section B.2.9 of the Route Permit application.

D.2. MAP OF PROPOSED CORRIDOR

Maps showing the location of exclusion and avoidance areas as defined in Section B.4 of the Route Permit Application are attached as Exhibit 7. Additional detailed maps of cultural resource and wetland avoidance areas are provided as appendices to Exhibits 2 and 3, respectively. An extended survey corridor has been identified on Exhibit 7, sections 17-20 of township 159N range 98W, in response to recent flooding in the area. Several potential alignments have been assessed and a final alignment will be selected within the identified corridor.

D.3. RELATIVE VALUE OF EVALUATION CRITERIA

This is a Consolidated Application for a Corridor Certificate and Route Permit. These elements are discussed in Section B.3 and B.4 of the Route Permit portion of this Application.

D.4. CRITERIA TO BE EVALUATED

This is a Consolidated Application for a Corridor Certificate and Route Permit. These elements are discussed in Section B.3 and B.4 of the Route Permit portion of this Application.

D.5. GENERAL MITIGATIVE MEASURES TO BE TAKEN

This is a Consolidated Application for a Corridor Certificate and Route Permit. These elements are discussed in Section B.6 of the Route Permit portion of this Application.

D.6. QUALIFICATIONS OF PERSONS CONTRIBUTING TO THE STUDY

Qualifications of contributors to the pipeline site location study are provided below:

- D.6.a **Lynelle A. Peterson, M.A., Ethnoscience (Cultural Resources)** – Lynelle Peterson is the president/owner and senior archaeologist of Ethnoscience. She has over 27 years experience as a supervisor for cultural resource investigations. Her expertise is Northern Plains prehistory, historic archaeology (1820-1880), and stone ring archaeology. She also has experience in both historic and prehistoric archaeology, and has worked in the Northern Plains, Great Basin, and Northern Plateau cultural areas. She worked six years with the National Park Service, spending three years examining Fort Union in northwest North Dakota. From 1989-1991, she worked for the University of North Dakota where she conducted numerous projects in the state. In 1991, Ms. Peterson joined Ethnoscience, Inc. and bought the company in 2003. Ms. Peterson has supervised hundreds of survey, testing, and mitigation projects. In addition to cultural resource inventories, testing, and mitigation, she has participated in the development of Cultural Resource Overviews, Environmental Impact Statements, Cultural Impact Assessments, Management Plans, as well as drafting Memoranda of Agreement (MOAs), MOUs, and Programmatic MOAs. Ms. Peterson was adopted into the Flint Knife clan of the Hidatsa in 2006.
- D.6.b. **Chad Cyrus, Big Sky Wildlife Consultants (Wildlife)** – The late Chad Cyrus was an experienced and reputable wildlife biologist and Principal Owner of Big Sky Wildlife Consultants with 18 years of experience based out of Miles City, Montana. He held multiple Bachelor of Science degrees in biology, education, and industrial technology from the University of Montana and was also a commercial pilot who conducted countless aerial wildlife surveys throughout the Upper Great Plains and Alaska. He was well versed in wildlife assessments, management, and mitigation. Mr. Cyrus conducted wildlife surveys on the Vantage Pipeline project until he was involved in a fatal airplane accident in August of 2011 while on a wildlife survey in eastern Montana.
- D.6.c. **Bryan Tolcser, Staff Biologist, Short Elliott Hendrickson, Inc. (Biologists)** – Mr. Tolcser is an experienced field scientist in wetland assessment and delineation of large-scale linear project corridors and site developments. Mr. Tolcser holds a Bachelor of Science in Biology from St. Lawrence University and a Masters in Science in Water Resources from the University of Minnesota. Bryan provides wetland delineation and permitting services and has experience in wetland functions and values assessments, threatened and endangered species surveys, habitat assessments, Global Positioning Systems (GPS), and Geographic Information Systems (GIS). Bryan was the lead wetland specialist on the field assessments conducted for the Vantage Pipeline project.
- D.7.d. **KC Harvey Environmental (Wildlife, Soils, Vegetation)**
- Brad R. Kovach, Senior Biologist** – Mr. Kovach has over 20 years of experience as a professional biologist in the private and public sectors. Brad has a Bachelor of Science degree in biology from Middle Tennessee State University and worked on a Master of Science in Ecology from the University of South Florida. Brad's experience is wide ranging and includes extensive

permitting, NEPA, and biological studies for transportation, pipeline and electric transmission projects throughout the U.S. Brad also does project management and facilitates intergovernmental coordination and public involvement. Mr. Kovach completed the Biological Assessment (BA) for the Vantage Pipeline project under the auspices of the U.S. Fish and Wildlife Service and provided coordination and technical review for worked on other tasks with the project team.

David P. Cameron, Principal Engineer – Mr. Cameron has practiced as a professional engineer in four states and is a specialist in reclamation design, water management, and NEPA EA/EIS with 31 years of professional experience in North America, Mexico, South America, and Australasia. David has a B.S. degree in Civil Engineering with an emphasis on geotechnical engineering from the University of Colorado. He also has vast experience in NEPA permitting and implementation of reclamation plans for mining, oil and gas, and other energy related projects. Mr. Cameron was the project manager for KC Harvey for the Vantage Pipeline Project and provided technical review and coordination for staff completing the environmental field surveys and environmental report covering wetland, vegetation, soils, water resources, wildlife and threatened and endangered species, health and safety, noise, land use, and transportation.

D.7. MAPS

D.7.a. Map the criteria within the study area showing the proposed corridor.

Maps showing the criteria within the study area are attached as Exhibit 7.

D.7.b. Mylar Maps of Study Area

Mylar maps are not included with this application because this map-producing process is no longer in use.

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NORTH DAKOTA PUBLIC SERVICE COMMISSION

APPLICATION OF VANTAGE PIPELINE US LP

for

ROUTE PERMIT

Vantage Pipeline Project

PSC Case No. PU-11-109

February 2012

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SECTION A: DESCRIPTION OF PROPOSED FACILITY

A.1. TYPE OF PROPOSED FACILITY

This is a Consolidated Application for a Corridor Certificate and Route Permit. These elements are discussed in Section A.1 of the Corridor Certificate portion of this Application.

A.2. PRODUCT

This is a Consolidated Application for a Corridor Certificate and Route Permit. These elements are discussed in Section A.2 of the Corridor Certificate portion of this Application.

A.3. SIZE AND DESIGN

This is a Consolidated Application for a Corridor Certificate and Route Permit. These elements are discussed in Section A.3 of the Corridor Certificate portion of this Application.

A.4. TIME SCHEDULE

This is a Consolidated Application for a Corridor Certificate and Route Permit. These elements are discussed in Section A.4 of the Corridor Certificate portion of this Application.

SECTION B: LOCATION

B.1. DISCUSS THE COMPANY'S POLICIES AND COMMITMENTS TO LIMIT THE ENVIRONMENTAL IMPACT OF ITS FACILITIES, INCLUDING COPIES OF BOARD RESOLUTIONS AND MANAGEMENT DIRECTIVES.

Vantage has prepared an Environmental Protection Plan (EPP) which is attached as Appendix A to the Environmental Report (ER) for the Vantage Pipeline, which is attached to this Application as Exhibit 1. The EPP is discussed in more detail in section B.6 below.

B.2. EVALUATION OF PROPOSED ROUTE WITH REGARD TO APPLICABLE CONSIDERATIONS SET OUT IN SECTION 49-22-09.

B.2.1. Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.

A discussion of the effects of the location, construction, and operation of the pipeline is provided in the ER attached to this Application as Exhibit 1. Research and investigation supporting the ER includes cultural resource surveys, wetland delineation surveys, and protected species surveys. Vantage has completed raptor surveys and proposes to conduct additional raptor surveys prior to the start of construction.

B.2.2. The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.

The project does not include new energy conversion or transmission technologies that are expressly designed to minimize adverse environmental effects. As described in Vantage's EPP (Appendix A to Exhibit 1), current construction techniques and mitigation measures will be utilized to minimize the effect of construction on environmental resources.

B.2.3. The potential for beneficial uses of waste energy from a proposed energy conversion facility.

The project does not involve new energy conversion facilities and no usable waste energy will result from the project.

B.2.4. Adverse direct and indirect environmental effects which cannot be avoided should the proposed route be designated.

Adverse environmental effects were minimized where possible. The following impacts are short term and completely reversible:

- Potential impacts to unavoidable wetland crossings
- Potential construction-related impacts to water quality
- Impacts to wildlife, plants, and habitat due to increased activity
- Establishment of noxious and invasive weed species
- Impacts to watercourse vegetation, trees and shrubs

- Impacts to soil impacts such as soil mixing, erosion, and compaction
- Temporary loss of hay and crops
- Construction-related air quality and noise impacts
- Visual resources impacts from permanent facilities

The majority of the construction-related impacts will be temporary. However, eight block valves will be permanently located on the surface during the design life for the pipeline. Landowners will be compensated for any impacts related to construction and operation of the pipeline according to an agreement established prior to pipeline construction.

B.2.5. Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize environmental effects.

Alternatives considered by Vantage during project development are discussed in section D.1 of the Certificate of Corridor Compatibility portion of this application.

B.2.6. Irreversible and irretrievable commitments of natural resources should the proposed corridor or route be designated.

A commitment of resources is considered irreversible when the current use of nonrenewable resources places limitations on future generations. An irretrievable commitment of resources occurs when a resource cannot be restored and becomes unavailable for use by future generations. Surface disturbance resulting from construction of the pipeline would be reclaimed and vegetation restored within the first growing season. A total surface area of approximately 0.58 acres would be occupied by block valves and access roads located along the pipeline route. Block valve locations and access roads would be removed and the land would be restored to its original state when the pipeline is no longer in operation; therefore, minimal irreversible and irretrievable commitments of natural resources will result from the project.

B.2.7. Direct and indirect economic impacts of the proposed facility.

Short-term and long-term economic impacts to communities within North Dakota include:

- Creation of additional workforce requirements during pipeline construction
- Creation of a permanent workforce for pipeline operations
- Economic benefits to landowners
- Economic benefit to local counties
- Temporary increase in local populations
- Temporary impacts to housing and public facilities and services
- Increased value for product provided to local oil and gas producers

Creation of a market for petrochemical grade ethane byproduct. These impacts are discussed in detail in the socioeconomics section of the ER (Exhibit 1).

B.2.8. Existing plans of the state, local government, and private entities or other entities for other developments at or in the vicinity of the proposed site, corridor, or route.

The proposed Plains Bakken North (oil) pipeline would be located in the northwest portion of Williams County. The southern end would be approximately 40 miles southwest of the south end of the Vantage Pipeline, and the distance between the two pipelines would narrow to about 8 miles before the Plains Bakken North pipeline extends into Canada. All other current and proposed pipeline developments are

predominantly in the southern half of Williams County, whereas the Vantage Pipeline route is in the northern half of Williams County and through Divide County. These projects are discussed in more detail in section 5.1.4 of the ER (Exhibit 1).

B.2.9. The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.

Structures associated with the Vantage Pipeline are small and unlikely to be adverse to the landscape appearance. If structures are visible, it would likely be from intersections where the pipeline crosses main roads. The occasional appearance of valve sites would not generally be out of character with such landscapes as are located in the productive Williston Basin oil field. No mitigation measures would therefore be required for visual resources.

A Class I literature review identified 38 previous projects that crossed within one mile of the pipeline centerline. Of these, two were completed prior to the establishment of current inventory standards and one was designed to identify rural churches. Thirty-five were completed to current cultural resource survey standards. These investigations documented 16 sites and 70 site leads/isolated finds. The identified sites include two railroads, 11 historic buildings, a farmstead, a bridge, a cemetery, and a prehistoric stone feature site. The site leads/isolated finds consist of 54 locations with chipped stone artifacts, 12 historic building leads, two townsite leads, a historic coal mine, and a stone ring site leads. Bethel Lutheran Church (32WI1887) and two lithic scatter site leads (32WIX301 and 32DVX177) are located within the project corridor.

The Class III inventory identified 79 sites and 19 isolated finds within 300 feet of the centerline. The sites consist of 50 prehistoric, 22 historic, and 7 sites that contain both historic and prehistoric resources. The prehistoric components consist of four lithic scatters in cultivated fields, 54 sites with stone features. Three of the multi-component sites contain isolated prehistoric artifacts within a site that is predominantly historic. The historic components consist of 11 trash scatters, 7 farmsteads, a site that contains a farm outbuilding and a coral, 2 barrow pits, 2 railroads, a church, and a coal mine. Four sites contain isolated historic artifacts within a predominantly prehistoric site. The National Register of Historic Places (NRHP) eligibility of the identified sites is not determined. There are 19 localities that do not contain sufficient materials to meet the North Dakota definition of a site. These are identified as isolated finds, or isolates. Isolates are not considered eligible for listing on the NRHP. The investigation observed no cultural districts or rural historic landscapes. Although there are similarities in the type of stone features observed in the project area, the sites are not sufficiently concentrated, and do not demonstrate sufficient linkage to indicate a shared relationship. There is no evidence for planned or designed development. Over 60 percent of the project area is cultivated and reflect rural use. However, the landscape is not associated with an important event, an important person, or shared architectural elements. None of the prehistoric components are evaluated for Traditional Cultural Properties.

In initial planning, Vantage rerouted the proposed pipeline route to avoid 38 of the previously identified sites. Of the 79 sites located within the 300-foot survey corridor, 33 are located in abandoned routes and 37 are at least 45 feet from the temporary construction corridor, and thus, can be properly avoided. While 6 sites are outside the temporary construction corridor, but still within the 45-foot buffer, Vantage would either “neck down” or adjust the temporary workspace to ensure the appropriate buffer is maintained and these sites are avoided. To avoid impacting the two identified railroad sites, Vantage would bore beneath the railroad grade. The pipeline would go through one farmstead. If determined eligible for listing on the NRHP, Vantage would bore beneath the site to avoid adversely affecting this site.

In addition, to avoid secondary impacts associated with artifact collecting and vandalism from/to any of the identified sites, Vantage would limit all activities by workers to the defined temporary construction corridor. This would provide a 45-foot buffer to the identified sites and would minimize the visibility of all but the standing structures and buildings. The construction of the pipeline and the associated facilities would constitute a temporary visual impact to NRHP-eligible properties with standing structures.

It is unlikely that any surface disturbance activities during construction could cause impacts to deposits capable of containing paleontological resources because the bedrock of the region is covered by varying thickness of Quaternary deposit, chiefly glacial drift, which rarely contains fossils.

B.2.10. The effect of the proposed route on areas which are unique because of biological wealth or because they are habitats for rare or endangered species.

Habitats for threatened and endangered species were identified by the USFWS. Six species of concern were identified as occurring within vicinity of the Vantage Pipeline, including: the Grey Wolf, the Interior Least Tern, the Whooping Crane, the Piping Plover, the Sprague's Pipit, and the Pallid Sturgeon. Of the identified species, the Whooping Crane, Piping Plover, and Sprague's Pipit were identified as potentially being impacted by construction of the Vantage Pipeline. Route selection avoided any areas identified as critical habitat for these species.

B.2.11. Problems raised by federal agencies, other state agencies, and local entities.

Considerations raised by federal and state agencies and local entities were gathered through consultation with the following:

- U.S. Fish and Wildlife Service (USFWS)
- ND Fish & Game Department (NDFG)
- ND Department of Health
- ND Department of Transportation
- ND State Archaeologist
- ND State Historic Society
- ND Tribal Historic Preservation Office
- ND State Historic Preservation Office (SHPO)
- ND State Water Commission
- U.S. Department of Agriculture, Natural Resource Conservation Service
- U.S. Army Corps of Engineers
- County Commissions for Divide and Williams Counties

Comments and concerns from these consultations are summarized in Table B-1 of the Certificate of Corridor Compatibility portion of this consolidated application.

B.3. IDENTIFY AND MAP THE CRITERIA THAT LED TO THE PROPOSED ROUTE LOCATION WITHIN THE DESIGNATED CORRIDOR.

Primary criteria considered in identification of the initial study corridor included minimizing the total pipeline distance and area of impact and minimizing impacts to wetlands and watercourses. The process for selecting the initial study corridor included evaluation of several alternatives within the study area:

- A direct route from Tioga, ND to the Canada – USA border crossing

- Potential use of the existing Hess Corporation alignment along the southern portion of the route
- Potential use of the abandoned BNSF railroad (east-west alignment) in the central portion of the route
- A route in the vicinity of the watershed divide which minimized wetland and water feature crossings

Based on the above factors a route located adjacent to existing Hess alignments on the southern extent of the project area was combined with a route that minimizes stream crossings in the northern portion of the project area. After selection of this general route, GIS data and aerial photography were used to identify potential environmental impacts. The route was then altered based on the following criteria to establish the preliminary study corridor:

- Minimize impact to wetlands and watercourses
- Avoid grassland easements
- Minimize federal or state owned land crossings
- Minimize road and railroad crossings
- Minimize impact to native grasslands
- Minimize impact to trees and shelter belts
- Minimize impacts to residents
- Address landowner concerns
- Apply a 500-foot buffer to local residences, schools, and places of business

Identification of the route and study corridor was followed by an onsite assessment of the existing environment to identify unknown potential environmental impacts. Additional route selection criteria used to select the pipeline route within the study corridor are discussed below. Landowner input was considered during determination of the final alignment location.

B.4. PIPELINE ROUTE SELECTION CRITERIA AND RELATIVE VALUES

In accordance with North Dakota Administrative Code (NDAC) § 69-06-08-02, the proposed route was selected after completing the route suitability evaluation process. The route alignment was selected after identifying exclusion areas and avoidance areas, and considering the selection and policy criteria discussed below.

B.4.1 Exclusion and Avoidance Areas

The North Dakota Public Service Commission (Commission) has classified geographical areas to be either excluded in the consideration of pipeline route options, or avoided unless no reasonable alternatives are available. “Exclusion and avoidance areas have been defined by the NDAC § 6906-08-02 as such; “Exclusion areas” are geographical areas that were excluded from consideration during routing of the Vantage pipeline; “Avoidance areas” were avoided, unless no reasonable alternative was available. Site assessments, data review, and analyses were completed to define exclusion and avoidance areas applicable to the Vantage Pipeline project area. Exclusion and avoidance areas within the study area (Williams and Divide counties, North Dakota) that led to the proposed facility location are identified in Tables B-4.1 and B-4.2.

Table B-4.1. Exclusion Areas Crossed by the Corridor		
AVOIDANCE AND EXCLUSION AREA	PRESENT WITHIN CORRIDOR?	SECTION ADDRESSED
National Memorial Parks	No	N/A
National Historic Sites and Landmarks	No	N/A
National Natural Landmarks	No	N/A
National Wilderness Areas	No	N/A
National Parks	No	N/A
National Monuments	No	N/A
State Parks	No	N/A
State Historic Sites	No	N/A
State Historical Markers	No	N/A
State Archaeological Sites	No	N/A
State Monuments	No	N/A
State Nature Preserves	No	N/A
County Parks and Recreation Areas, Municipal Parks, and Parks under other Governmental Jurisdiction	No	N/A
Areas Critical to the Life Stages of Threatened or Endangered Animal or Plant Species	No	N/A
Areas Where Animal or Plant Species Unique or Rare in the State Would be Irreversibly Damaged	No	N/A

Table B-4.2. Avoidance Areas Crossed by the Corridor		
AVOIDANCE AND EXCLUSION AREA	PRESENT WITHIN CORRIDOR?	SECTION ADDRESSED
National Wildlife Areas	No	N/A
National Wildlife Refuges	No	N/A
National Grasslands	Yes	B.4.1.1
National Historic Districts	No	N/A
National Wild, Scenic or Recreational Rivers	No	N/A
State Wild, Scenic or Recreational Rivers	No	N/A
State Game Refuges	No	N/A
State Game Management and Management Areas	Yes	B.4.1.2
State Forests	No	N/A
State Forest Management Lands	No	N/A
State Grasslands	No	N/A
Irrigated Land	No	N/A
Historical Resources which are not Specifically Designated as Exclusion or Avoidance Areas	Yes	B.4.1.3
Areas of Recreational Significance	No	N/A
Areas which are Geologically Unstable	No	N/A
Within 500 Feet of an Inhabited Residence, School, or Place of Business	Yes	B.4.1.4
Reservoirs	No	N/A
Municipal Water Supplies	Yes	B.4.1.5
Water Sources for Organized Rural Water Districts	No	N/A

B.4.1.1 National management areas

No designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; or wildlife refuges were identified within the survey corridor. Parcels participating in the following national programs will be traversed by the pipeline: USFWS grassland easements and Conservation Reserve Program (CRP).

Grassland easements

The United States Fish and Wildlife Service (USFWS) designated several parcels in the pipeline study area as grassland easements. A grassland easement is an agreement between the USFWS and landowners to protect grassland habitat. The program requires landowners to cease cultivation and restricts mowing, haying and seeding activities. The majority of grassland easements within the vicinity of the pipeline corridor were avoided during pipeline routing. One unavoidable grassland easement is illustrated in Exhibit 7. Vantage will work closely with the USFWS to determine best management practices which will minimize impacts to this easement.

Conservation Reserve Program

The pipeline route will cross approximately 23.3 miles of tracts enrolled in the Conservation Reserve Program (CRP). The CRP program is administered by the NRCS Farm Service Agency (FSA), and is a voluntary reserve program through which landowners of eligible farmland establish a long-term (10 to 15-year) agreement to preserve vegetative land cover. The CRP is intended to control water runoff and sediment from directly entering groundwater, nearby lakes, rivers ponds and streams while contributing to

wildlife habitat (USDA/FSA, 2010). Since the impacts to CRP land will be minimized by post-construction reclamation, the location of CRP land was not factored into the route selection criteria. Vantage will restore all CRP lands in accordance with FSA requirements.

USFWS Waterfowl Production Areas

USFWS Waterfowl Production Areas (WPAs) in Divide and Williams Counties were not crossed by the proposed route and disturbance of these areas will not result from construction of the pipeline.

B.4.1.2 State management areas

No designated or registered state: wild, scenic or recreational rivers; game refuges; game management areas; forests; or forest management areas were identified within the survey corridor.

Private Lands Open to Sportsmen

Parcels participating in the Private Lands Open to Sportsmen (PLOTS) state management program will be traversed by the pipeline. The PLOTS program is an agreement between the North Dakota Fish and Game Department (NDFG) and the landowner allowing public walk-in hunting access under the PLOTS conditions set forth in the NDFG policy. The location of PLOTS land was not factored into the route selection criteria since the impacts would be mitigated following construction. The proposed Vantage Pipeline route crosses approximately 4.9 miles of PLOTS tracts. Pipeline construction will result in temporary impacts at these locations and vegetation will be restored to preconstruction conditions. Refer to Exhibit 6 for PLOTS lands crossing locations.

North Dakota Land Department

State land is encountered in two locations along the proposed route, refer to Exhibit 7. The first location required crossing of 0.04 miles of state land. Crossing of state land in this location was minimized by routing the alignment across the corner of the state parcel. In the second location, the route traverses a full state section near the Canadian Border. The border crossing in this location was fixed and coordinated with the Canadian portion of the alignment. Avoidance of numerous wetlands, grassland easements and waterfowl production areas in this area limited alternative routes in the vicinity of the border crossing.

B.4.1.3 Cultural (historical) resources

The Area of Potential Effect (APE) for cultural and historical resources is defined as the geographic area or areas within which the proposed action may directly or indirectly cause changes in the character or use of historic properties. The APE for direct impacts is 45 feet, and for secondary impacts the APE is equal to the 300-foot-wide corridor.

As discussed below, cultural resources associated with the physical remains of past human activity, including artifacts, features, sites, districts, or landscapes, were identified during investigations of the APE. Historic property categories include architectural buildings, structures, and archeological features. Potential historic cultural resources occurring in the project area include buildings, homesteads, ranches, transportation features, and refuse dumps. A total of 79 cultural sites were identified within the study corridor.

Vantage has avoided 76 of the 79 identified sites by either routing the pipeline away from the site or employing an appropriate buffer. The remaining sites include two railroad crossings and a farmstead. Vantage will bore beneath the railroad grade to avoid impacts to the railroad sites. Total avoidance of the railroads is not possible since the railroad alignments encompass a large geographic area. The farmstead site is being evaluated to determine eligibility on the National Register for Historic Places. If it is determined that the site is eligible, Vantage would avoid impacting the site by boring beneath the site.

The Proposed Action will not result in any direct impacts to identified prehistoric or historic cultural resources. To avoid secondary impacts associated with artifact collecting and vandalism from/to any of the identified sites, Vantage will limit all activities to the defined a temporary construction corridor. This will provide a 45-foot buffer to the identified sites and will minimize the visibility and access to the sites.

B.4.1.4 Inhabited residences within 500 feet

In an effort to comply with landowner requests, Vantage has routed the pipeline along the west edge of 134th Ave NW. This route option comes within approximately 375 feet of one inhabited residence. During construction, residences within 500 feet of the pipeline will experience a short-term inconvenience due to construction equipment noise. Noise will be intermittent, depending on the type of equipment used. In order to mitigate noise impacts to residences during construction, Vantage will limit construction activities primarily to daylight hours.

B.4.1.5 Municipal water supplies

No public water supply wells are located within one mile of the proposed pipeline route. Vantage will obtain hydrostatic test water from major water bodies crossed by the pipeline and/or municipal or private sources along the pipeline route. Hydrostatic testing is discussed in section B.10.7 of this Route Permit.

B.4.2 Selection Criteria

Additional selection criteria have been defined by the NDAC § 69-06-08-02. Selection criteria that led to the proposed facility location within the study corridor is identified and ranked in Table B-4.3. The section where each criterion is addressed is identified in the table. The relative value for each criterion is ranked as high or low. Primary selection criteria were ranked as high and secondary selection criteria were ranked as low.

CRITERIA	PRESENT WITHIN CORRIDOR?	RELATIVE VALUE	SECTION ADDRESSED
Wetlands, Woodlands and Wooded areas	Yes	High	B.4.2.1
Plant Life	Yes	High	B.4.2.2
Human Health and Safety	Minimal	High	B.4.2.3
Animal Health and Safety	Minimal	High	B.4.2.3
Agriculture	Yes	Low	B.4.2.4
Family Farms and Ranches	Yes	Low	B.4.2.4
Land Suitable for Irrigation	Minimal	Low	B.4.2.5
Surface Drainage and Groundwater Flow Patterns	Minimal	Low	B.4.2.6
Noise-sensitive Land Uses	None	Low	B.2.4.7
Visual Effects	None	Low	N/A
Extractive and Storage Resources	None	Low	N/A
Communication or Electric Control Facilities	None	Low	N/A

B.4.2.1 Wetlands

Vantage conducted a conservative and approximate inventory of wetland boundaries along the initial 77-mile long, 500-foot wide Vantage Pipeline corridor based upon visible hydrology and vegetation indicators. Preliminary correspondence with the U.S. Army Corps of Engineers indicated that formal wetland delineations were not necessary for pipeline route planning. Rather, a conservative and approximate wetland boundary would be appropriate for impact avoidance and minimization efforts. Full wetland delineations were therefore not completed during the preliminary field surveys, nor was soil data collected during the field inventory.

The wetland investigation resulted in the identification and mapping of 139 wetlands within the 500-foot Vantage Pipeline corridor. Exhibit 3 provides a summary of the wetlands and riparian zones encountered and classifies each by wetland type.

Permanent impacts are those that involve permanent dredging of material from, or the placement of permanent fill into waters of the United States, including wetlands. No pump stations or other permanent

structures will be constructed. The proposed project will therefore not create any permanent impacts to wetlands.

Total avoidance of all wetlands was not possible due to the high density of wetlands in the project area. Wetlands located along natural drainages were not avoidable since the proposed alignment required crossing of drainages. The proposed project will temporarily impact 1.05 acres of wetland within the permanent right-of-way, as shown in Table B-4.4. All temporary impacts to wetlands will be minimized to the extent practicable. Wetland soils excavated during pipeline construction will be stockpiled for reuse and the area will be restored to its original grade and seeded or planted with native plants after construction. Horizontal boring will be used where trenching is not practical. Construction workspaces, including stockpiles, lay down areas, and construction staging areas will be located outside of wetlands. Detailed wetland mitigation measures are provided in Appendix A of the ER (Exhibit 1).

CLASSIFICATION		WETLANDS OBSERVED	
Circular 39 ¹	Cowardin ²	Number	Area (acres)
1	PEMA	1	0.05
2	PEMB	5	0.09
2/3	PEMB/C	5	0.30
3	PEMC	1	0.22
3/4	PEMC/F	1	0.05
5	PUB	1	0.34
Totals*		14	1.05

*Note that areas listed in tables do not sum to total impact area due to rounding

¹ *Wetlands of the United States, Circular 39.* (Shaw and Fredine, United States Fish and Wildlife Service, 1956)

² *Classification of Wetlands and Deepwater Habitats of the United States.* (Cowardin *et al.*, December 1979)

Wetland easements

Due to the high density of wetlands and wetland easement parcels in the project area, total avoidance of wetland easement parcels was not possible. Individual wetlands within the parcels covered by wetland easements were avoided to the extent practicable. Upland areas within the parcels are not protected by the wetland easement. The proposed alignment traverses upland areas within several parcels that are enrolled as USFWS wetland easements. Vantage has provided the routing in these areas to the USFWS and will coordinate with the USFWS to mitigate potential impacts to wetlands. Vantage will continue to coordinate with the Crosby Wetland Management District regarding the USFWS wetland easements.

B.4.2.2 Plant life

A baseline environmental assessment served as the primary source for the identification of vegetation within the APE. Vegetation along the pipeline route was classified according to the Multi-Resolution Land Characteristics Consortium (MRLC). Upland areas characterized by natural or semi-natural herbaceous vegetation; herbaceous vegetation accounts for approximately 20 percent of the cover are defined as Herbaceous Upland Natural/Seminatural Vegetation.

Herbaceous Upland Natural/Semi-natural Vegetation comprises 20 percent of the corridor, and will be crossed by the Vantage Pipeline for 15.8 miles. Approximately 291 acres of uplands consisting of herbaceous natural and semi-natural vegetation will be temporarily disturbed during construction of the

Vantage Pipeline. Where possible routing selection favored cultivated land and avoided native vegetation. Vantage will restore upland areas to preconstruction conditions as soon as practical following construction. Each area will be seeded to establish the dominant species present prior to construction disturbance.

Approximately 0.32 acres of herbaceous natural/ semi-natural and herbaceous planted vegetation will be permanently impacted due to the construction and operation of block valve locations and roads providing access to those valve locations. Specifically, three block valve locations will be located within upland areas that will not be restored following completion of the construction activities. The block valve locations will be fenced and will each include an access road to allow inspections and maintenance. The impacts to upland areas caused by each block valve location are identified below in Table B-4.5 and in Exhibit 6.

Any trees and/or shrubs along the permanent right-of-way that were cleared during construction will not be replanted since the right-of-way will need to be free of such vegetation to allow for pipeline inspection and maintenance.

BLOCK VALVE NUMBER	MILEPOST	LAND COVER	AREA (acres)
BV-0	0.0	Grassland	0.05
BV-1	7.8	Grassland	0.11
BV-4	52.7	Grassland	0.11
BV-7	71.9	Pasture	0.05
Total area*			0.32

B.4.2.3 Human and Animal Health and Safety

Transportation of liquid ethane by pipeline involves some risk to the public and to the environment in the event of an accident or release. The main causes of pipeline incidents in the United States are corrosion, excavation damage, pipe or weld failure, incorrect operations, or natural causes (e.g., floods). To avoid pipeline incidents, the federal government has established minimum pipeline safety standards under the U.S. Code of Federal Regulations (CFR), Title 49 “Transportation,” Parts 190–199. The Office of Pipeline Safety (OPS), Pipeline and Hazardous Materials Safety Administration (PHMSA), within the U.S. Department of Transportation (DOT), is the primary federal enforcement agency that regulates the safety of hazardous liquid and gas pipelines within the United States. The North Dakota Pipeline Authority (NDPA), within the Industrial Commission of North Dakota, is the jurisdictional state agency responsible for assisting operators with the development of pipeline facilities to support the production, transportation, and utilization of North Dakota energy-related commodities.

DOT is mandated, pursuant to 49 U.S.C. Chapter 601, to regulate the safety of pipelines. Within DOT, PHMSA administers the national pipeline regulatory program to ensure the safe transportation of hazardous liquids, including liquid hydrocarbons, by pipeline. PHMSA specifically develops safety regulations and other approaches to risk management that mandate safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards that set safety attainment levels which can be achieved through the use of various technologies. Of those, Parts 190, 194, 195, 198, and 199 are relevant to hazardous liquid pipelines. The following highlights key PHMSA regulations that apply to the Vantage Pipeline:

- Part 190 describes the procedures for carrying out regulatory duties, including inspection of pipelines and enforcement of the regulations.
- Part 194 contains requirements for spill response plans and emergency response plans intended to reduce the environmental impact of liquid hydrocarbons discharged from onshore pipelines.
- Part 195 prescribes the safety standards and reporting requirements for hazardous liquid pipelines, including detailed requirements on a broad spectrum of areas related to the safety and environmental protection of hazardous liquid pipelines.
- Part 199 requires operators of gas and hazardous liquid pipelines to establish programs for preventing alcohol misuse and to test employees for the presence of alcohol and prohibited drugs.

PHMSA policies also address pipeline safety standards near high consequence areas (HCAs). The Vantage Pipeline HCAs include the town of Tioga, North Dakota (population 1127) and environmentally sensitive areas (wetlands) as defined in 49 CFR Part 195.6 located adjacent to the alignment.

To ensure safe pipeline construction, operation, and maintenance, the Vantage Pipeline will be constructed and maintained to meet or exceed requirements and standards established by DOT, PHMSA, and North Dakota PA, as well as industry standards. Applicable industry standards include those issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers and American Petroleum Institute. Details related to the Vantage Pipeline's specifications, and compliance with state and federal standards related to pipeline specifications are additionally provided in section 4.1.4. of the ER (Exhibit 1).

B.4.2.4 Agricultural /Family Farms and Ranches

Cultivated crops and pasture/hay production accounts for approximately 63.8 miles, or 80% of the Vantage pipeline route, as shown in Table B-4.6. Avoidance of agricultural land is not possible since agricultural production is the primary land use in the project area. Approximately 435 acres of cultivated land used for production of row crops and small grains will be temporarily disturbed and removed from production during construction. Construction activities, including trenching, pipe installation, backfilling, and access will temporarily disturb the cropland within both the construction and permanent right-of-way.

Vantage will restore agricultural land to preconstruction conditions as soon as practicable following construction. Agricultural production will resume during the growing season following completion of the pipeline construction. Landowners will be compensated for crop losses and other damages resulting from the pipeline construction. During construction, Vantage will maintain landowner access to the fields, storage areas, and other agricultural facilities in order to reduce impacts on planting and harvesting. Any drainages systems such as roadway ditches crossed by the pipeline and disturbed during construction will be maintained to the extent practicable. Repair of drainage systems will be completed in accordance with Vantage's mitigation plans.

Table B-4.6. Cultivated Crops along the Vantage Pipeline Route

GENERAL AND SUBCLASS DESIGNATION	GENERAL DESCRIPTION	DISTANCE ALONG PIPELINE	
		[mi.]	[%]
Herbaceous Planted/Cultivated			
Cultivated Crops	<i>Row Crops</i> - Areas used for the production of crops, such as corn, soybeans, vegetables, tobacco, and cotton. <i>Small Grains</i> - Areas used for the production of graminoid crops such as wheat, barley, oats, and rice.	47.3	59%
Pasture/Hay	Grasses/legumes planted for livestock grazing or the production of seed or hay crops	16.5	21%
Total		63.8	80%

Permanent impacts to land use will occur in the locations of the four block valves identified in Table B-4.7 and Exhibit 7. Specifically, approximately 0.27 acres will be removed from crop production permanently to accommodate the block valve locations and access roads. The block valve locations will be fenced and the permanent access road will be necessary to allow inspections and maintenance. Access to the block valve locations will typically follow the 30-foot-wide permanent right-of-way. Four of the block valve locations are within cropland areas that will not be restored to upland following completion of the construction activities. The block valve locations will be fenced and will include an access road to allow inspections and maintenance. An area of approximately 0.27 acres will be required for the block valve locations and access roads. These locations will be permanently removed from crop production.

Table B-4.7. Block Valve Locations Within Cropland

BLOCK VALVE NUMBER	MILEPOST	LAND COVER	AREA (acres)
BV-2	19.8	Cultivated cropland	0.08
BV-3	37.5	Cultivated cropland	0.06
BV-5	59.8	Cultivated cropland	0.07
BV-6	65.2	Cultivated cropland	0.06
Total area*			0.27

Although present, livestock grazing was not found to be a significant land use within the areas traversed by the Vantage Pipeline. Some parcels are fenced and grazing of horses, cattle and other livestock may occur. Vantage will take appropriate measures to protect livestock during construction. Vantage will coordinate with landowners to provide passage for livestock and will provide temporary fencing and gates where required to protect livestock from construction-related hazards. Following construction, fences and gates will be rebuilt to original condition.

B.4.2.5 Land Suitable for Irrigation

The pipeline crosses a number of parcels that may not currently be in crop production, but are suitable for crop production in the future. These lands consist of soils designated as “prime farmland” or “farmland of state or local importance.”

As defined by the NRCS, prime farmland is “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is also available for these uses.” Indicators of prime farmland include adequate moisture supply, permeability, acceptable acidity and alkalinity levels, acceptable salt and sodium content, and few rocks (NRCS, USDA 2009). These

characteristics used to classify soils as prime farmland, farmland of statewide importance, prime farmland if drained, and prime farmland if irrigated. Since soils consisting of prime farmland and farmland of statewide importance represent a significant portion of the project area, total avoidance of these soil types was not practicable. The proposed Vantage Pipeline Route crosses 0.7 miles of prime farmland and 31.7 farmland of statewide and local importance. Farmland classification along the proposed route is provided in Table B-4.8.

FARM CLASSIFICATION	LENGTH (MI)	PERCENTAGE OF TOTAL PIPELINE LENGTH
Prime farmland	0.7	0.9%
Farmland of statewide importance	31.7	39.7%
Not prime farmland	45.0	56.4%
Prime farmland if drained	0.8	1.0%
Prime farmland if irrigated	1.6	2.0%
Totals	79.8	100.0%

Pipeline construction operations that contribute to soil impacts include: grading, trenching, backfilling, right-of-way traffic, and clean-up activities. The most common impact associated with these pipeline construction activities is the mixing of organic and nutrient-rich topsoil with less fertile mineral subsoil. The loss of organic matter and nutrients from the root zone can affect plant growth in varying degrees, depending on the type of vegetation.

In order to mitigate the potential for mixing soils, Vantage would use soil-handling mitigation options outlined in Appendix A to the ER (Exhibit 1). Vantage would segregate salvaged topsoil and subsoil into separate stockpiles. During trench backfilling, subsoil material would be placed and graded prior to topsoil spreading.

B.4.2.6 Surface drainage and groundwater flow patterns

As indicated in Table B-1 of the Corridor Certificate portion of this application, Vantage will obtain a construction storm water permit (NDR10-0000) from the NDDH and prepare a Storm Water Pollution Prevention Plan (SWPPP).

B.4.2.7 Noise

The project area is sparsely populated and primarily rural/agricultural in nature. Noise-sensitive areas include private residences. Existing noise levels within the project area are representative of rural conditions and are expected to be between 35 and 45 dBA, except near roads where noise levels may be as high as 65 dBA. Noise levels from traffic along the interstate typically average greater than 70 dBA.

Median noise levels for the proposed project area likely range from 20 to 40 dBA in the morning and evening and from 50 to 60 dBA in the afternoon when wind speeds are typically greatest. Noise may exceed 70 dBA in close proximity to specific pieces of equipment or operations during pipeline construction.

Noise levels will temporarily increase near the project area during pipeline construction activities. Residences within 500 feet of the Vantage Pipeline right-of-way will experience short-term inconvenience from construction equipment noise. Noise would be intermittent, depending on the construction schedule and the size and types of equipment used for soil stripping, trenching, pipe installation, backfilling and soil spreading.

B.4.3 Policy Criteria

In accordance with NDAC Section § 69-06-08-02, the Commission may give preference to applicants that demonstrate the use of policies and practices listed Table B-4.9, and in a proper case, may require the adoption of such policies and practices.

Table B.4-9: Policy Criteria	
CRITERIA	SECTION ADDRESSED
Location and design	B.4.3.1
Training and utilization of available labor in this state for the general and specialized skills required	B.4.3.3
Economies of construction and operation	B.4.3.3
Use of citizen coordinating committees	B.4.3.4
A commitment of a portion of the transmitted product for use in this state	B.4.3.5
Labor relations	B.4.3.6
The coordination of facilities	B.4.3.7
Monitoring of the impacts	B.4.3.8, B.6
Utilization of existing and proposed rights of way and corridors	B.4.3.9
Other existing or proposed transmission facilities	B.4.3.10, B.2.8

B.4.3.1 Location and design

Vantage studied a variety of alternatives for the project. System alternatives and route alternatives were evaluated by their ability to meet project objectives, technical and economic feasibility, and potential environmental impacts for each alternative.

System alternatives are options to the Proposed Action that would make use of other existing pipeline or transportation systems to meet the stated objectives of the project. No other pipelines currently exist in the area to transport ethane to markets located in Alberta. Rail or truck transport is not an economic alternative to transport ethane.

Vantage conducted a detailed quantitative analysis of environmental impacts along each major route alternative. Publicly available sources of environmental data described in Section 2.2.3.1 of the ER (Exhibit 1) were supplemented by field reviews. Initial environmental considerations included impacts to exclusion and avoidance areas, followed by the selection criteria outlined in sections B.4.2 and section B.3 of this application. After review, Vantage identified no major route alternatives in North Dakota for the Vantage Pipeline. For a detailed discussion of route alternatives refer to section 2.2 of the ER (Exhibit 1).

B.4.3.2 Training and utilization of in-state labor

Vantage will use local labor to the extent practicable. Various pipeline companies located within North Dakota have the necessary training and expertise required to construct the Vantage pipeline.

B.4.3.3 Economies of construction and operation

The construction of the Vantage Pipeline will serve the national interest by providing the ethane-producing Bakken Formation region of North Dakota with access to the existing Alberta Ethane Gathering System (AEGS) pipeline infrastructure and market in Alberta, thereby helping to meet the President's goals of increasing U.S. exports, while also helping energy producers in the United States to increase revenues from existing resources. In addition, the Vantage Pipeline will contribute to employment and the tax base of North Dakota.

In recent years, natural gas production in the Bakken Formation region of North Dakota has been increasing as oil reserves are developed. Natural gas, which is primarily comprised of methane along with smaller amounts of ethane, propane, butane, and condensate (natural gasoline), is produced along with oil. Many of these materials are extracted separately from the natural gas and sold to consumers. Currently, no infrastructure exists to transport ethane to markets that use ethane as a feedstock. Natural gas production in North Dakota where it is economically feasible to extract ethane from the natural gas, provided an opportunity to extract and transport ethane to the Alberta petrochemical industry..

Ethane is currently used as a feedstock by the petrochemical industry in Alberta, Canada, where petrochemical facilities convert ethane to ethylene. Ethylene is the building block for a wide range of consumer and industrial products, such as plastics, antifreeze, rubber, detergents, and solvents. Ethane is currently transported to/distributed amongst the Alberta petrochemical industry by the existing Alberta Ethane Gathering System (AEGS) pipeline infrastructure. Construction of the Vantage Pipeline will provide North Dakota natural gas producers with access to the AEGS, making it economically feasible to begin extracting ethane from processed natural gas.

The Vantage Pipeline will also assist in meeting national interests to increase exports. On March 11, 2010, through Executive Order, the President issued a National Export Initiative ("NEI") focused on "ensuring that U.S. businesses can actively participate in international markets by increasing their exports of goods, services and ... products." See NEI, available at <http://www.whitehouse.gov/the-press-office/executive-order-national-export-initiative>. The NEI was issued to help meet the President's goal of doubling U.S. exports in 5 years by helping firms enter new export markets. In a report recently issued on September 16, 2010, the Export Promotion Cabinet established by the NEI, recommended that Canada and Mexico play a special role as the United States' largest export market (http://www.whitehouse.gov/sites/default/files/nei_report_9-16-10_full.pdf). The NEI Cabinet reiterated that increasing U.S. exports to countries, including Canada, is "good for American business, good for American workers and good for American jobs." The Vantage Pipeline will assist in meeting the goals of the President's NEI by increasing exports of ethane to Canada by 2013 by providing an economic ethane market to North Dakota natural gas producers.

Apart from the national benefit of expanded export opportunities, North Dakota producers of ethane will receive an additional 20-30 percent value for selling ethane to consumers in the Canadian petrochemical industry. The Vantage Pipeline will benefit the nation's energy sector, and make more productive use of existing resources, with a minimal investment and no significant adverse environmental impact.

The \$300 million investment in the construction of the Vantage Pipeline will provide additional economic benefits to those communities where the Vantage Pipeline will be constructed. In the United States, approximately \$60 million would be invested in North Dakota. North Dakota towns and communities along the pipeline route will benefit from increased spending during pipeline construction. In addition, 60 – 75 persons will be employed during the proposed six month-long construction period. Long-term employment opportunities will be created for 2 – 3 individuals for ongoing pipeline operations.

B.4.3.4 Citizen coordinating committees

Vantage initiated discussions with federal and state agencies regarding the proposed project in mid-summer, 2010. Vantage initiated preliminary outreach with landowners and local, county, state, and federal elected officials along the proposed pipeline route. Vantage is prepared to hold applicant-sponsored public informational sessions (i.e., open houses) and/or participate in agency-led scoping meetings at key locations along the pipeline route, with the intent to identify issues and to receive public input.

Vantage has initiated preliminary outreach with landowners and local, county, state, and federal elected officials along the proposed pipeline route. All landowners of record have received a letter introducing the project. The letters, dated August 13 through August 23, 2010, provided an overview of the project and a fact sheet addressing the specifics of the project along with a map depicting the location. A website was established to provide stakeholders with an array of information about the project, including maps and points of contact if more information is needed.

Vantage attended meetings with the Divide and Williams County Commissioners and made presentations about the project on August 24, 2010. Vantage also phoned county commission chairs in both counties. The Commissioners gave unanimous approval to the project. Vantage has incorporated messaging regarding easement, safety, environmental stewardship, land use and reclamation and tax benefits into their information materials.

B.4.3.5 A commitment of a portion of the product for use in the state

No market for the sale of ethane as a feedstock exists in North Dakota.

B.4.3.6 Labor relations

No labor relations will be affected by the project.

B.4.3.7 Coordination of facilities

The need for the project is dictated by the increasing ethane supplies in the Williston Basin, and demonstrated interest from the petrochemical industry in Alberta to purchase these increased supplies. Vantage has signed a contract with Hess Corporation (Hess) and NOVA Chemicals Corporation (NOVA) to purchase and transport ethane from the existing Hess' Tioga Gas Plant to NOVA's existing Joffre Petrochemical Complex in Alberta under a long-term agreement.

B.4.3.8 Monitoring of impacts

Vantage will employ on-site environmental monitors during construction to ensure that wetland, cultural, and wildlife restrictions are adhered to at all times. Vantage will employ BMPs to monitor storm water runoff in accordance with the Stormwater Pollution Prevention Plan. All monitoring of impacts will be completed in accordance with measures described in section B.6 of this application.

B.4.3.9 Utilization of existing corridors

Vantage will utilize the existing Hess Pipeline corridor where practicable along the southernmost twelve miles of the route.

B.4.3.10 Other existing or proposed transmission facilities.

The proposed Plains Bakken North (oil) pipeline will be located in the northwest portion of Williams County. The southern end will be approximately 40 miles southwest of the southern end of the Vantage Pipeline. Additional details are discussed in section B.2.8 of this Application. No other ethane pipelines exist in the project area or are proposed at this time.

B.5 THE CRITERIA TO BE EVALUATED SHALL INCLUDE AT A MINIMUM ALL OF THE FOLLOWING, WHICH ARE WITHIN THE DESIGNATED CORRIDOR:

- a. Exclusion areas
- b. Avoidance areas
- c. Selection criteria
- d. Policy criteria
- e. Design and construction limitations
- f. Economic considerations

Complete descriptions, potential impacts, and mitigation measures relevant to the six criteria cited above are provided in Section B.4, in conjunction with the descriptions of potential impacts. Additional measures to be employed by Vantage are discussed in Section B.6.

B.6. MITIGATIVE MEASURES

The Vantage Pipeline EPP (Appendix A to Exhibit 1) provides a comprehensive description of environmental measures to be used during construction of the Vantage Pipeline in order to minimize potential construction-related impacts. The EPP contains environmental best management practices (BMPs) to be implemented by the pipeline contractor(s) during pre-construction, construction, cleanup and reclamation, and post-construction monitoring. It includes emergency and project contacts as well as contingency plans for spills, fire, soil erosion, instream boring fluids mud release, water crossing sediment, winter or frozen conditions, sensitive plants, wildlife, and cultural resources. All contractor and subcontractor activities would be overseen by Vantage representatives. Mitigative measures are discussed in the following guidelines and plans included in the EPP:

- Spill Contingency Plan Guidelines
- Fire Contingency Plan
- Soil Conditions Contingency Plan
- Soil Erosion Contingency Plan
- Instream Boring Fluids Mud Release Contingency Plan
- Water Crossing Sediment Contingency Plan
- Winter or Frozen Conditions Contingency Plan
- Sensitive Plants Contingency Plan
- Wildlife Contingency Plan
- Cultural Resources Contingency Plan

B.7. QUALIFICATIONS OF PERSONS CONTRIBUTING TO THE STUDY

This is a Consolidated Application for a Corridor Certificate and Route Permit. Qualifications of persons contributing to the study are discussed in Section D of the Corridor Certificate portion of this Application.

B.8. MAPS

Please see section D.7 of the Corridor Certificate portion of this Application.

B.9. RIGHT-OF-WAY PREPARATION, CONSTRUCTION, AND RECLAMATION

B.9.1. Right-of-Way Preparation, Survey and Staking

Before construction, Vantage crews would survey and stake the centerline and exterior boundaries of the construction right-of-way. The exterior boundary stakes would mark the limit of approved disturbance areas which would be maintained throughout the construction period. The North Dakota State One Call system would be contacted to identify and mark the locations of underground utilities. In addition to the North Dakota State One Call the pipeline contractor would conduct an independent sweep to locate underground utilities. During this period, equipment involved in pipeline construction would be moved onto the right-of-way using existing roads for access wherever practicable.

B.10. CONSTRUCTION

All construction activities will be monitored by qualified inspectors.

B.10.1. Clearing and Grading

Vantage would clear the 70-foot-wide construction right-of-way and temporary extra workspaces of shrubs and trees. The clear width may be necked down to avoid sensitive locations accordance with the EPP. The clearing crew would typically mow, chip, mulch, and/or haul off all non-merchantable timber. Burning of non-merchantable wood may be allowed when the contractor has the necessary permits and approvals.

Following clearing, grading of the ground surface may be done to provide a relatively smooth working surface and a safe working area. Typically, a 10-foot-wide buffer would be left relatively undisturbed at waterbody crossings except where grading is needed for bridge installation. This would occur just prior to the pipeline installation across the waterbody.

Following clearing and grading, temporary bridges may be installed at waterbodies, except for drainage ditches, intermittent waterbodies, and other non-fisheries water, along the pipeline route to provide temporary access for equipment traveling along the construction right-of-way. In addition, temporary erosion control measures would be installed in accordance with the EPP.

B.10.2. Topsoil Stripping

Topsoil would be stripped and segregated in agricultural areas, cropland, hayfields, pasture, and other areas as requested by the landowner, along the pipeline route in accordance with the EPP. In other areas, a maximum of 12 inches of surficial soils would be stripped from directly over the trench, in accordance with the EPP.

B.10.3. Stringing and Bending

Before excavating pipeline trenches, individual joints of pipe would be strung along the construction right-of-way and arranged to be accessible to construction personnel. This operation typically involves specially designed stringing trucks to deliver pipe from pipe yards to the right-of-way.

Small portable cranes and/or side-boom tractors are used to unload the stringing trucks and place pipe along the right-of-way. A mechanical pipe-bending machine would bend individual joints of pipe to the

desired angle to accommodate natural ground contours or pipeline alignment. In certain areas, prefabricated fittings would be used where field bending is not practicable.

B.10.4. Welding and Coating

After stringing and bending are complete, pipe sections would be aligned, welded together, and placed on temporary supports along the edge of the trench. The welds would be inspected, both visually and radiographically. The pipe is typically delivered with a factory coating of yellow jacket or similar material to prevent corrosion. Coating sleeves would be applied at the welded joints and then the coating would be electronically inspected before the pipe is lowered into the trench.

B.10.5. Trenching

Backhoes and/or ditching machines would be used to excavate trenches in accordance with the U.S. Department of Transportation (DOT). A minimum 4 feet of cover for normal excavations and 18 to 30 inches of cover in rocky areas will be used. The trench walls would generally be kept vertical to the extent practicable and the trenches would typically be 2 feet wide at the base of the trench. In unstable and saturated soils, trenches may be wider.

Where trench dewatering is needed, water would be discharged in accordance with requirements for the temporary discharge permit issued by the North Dakota Department of Health – Division of Water Quality. Best Management Practices would be used to mitigate potential for erosion and sediment discharge. Where vegetation is sparse or absent, or in environmentally sensitive areas (e.g., adjacent to waterbodies or wetlands), straw bale dewatering structures or suitable filtering alternatives would be used to minimize siltation in adjacent waterbodies.

B.10.6. Lowering-in and Backfilling

After welding and coating are completed and the trench is excavated, the pipe would be lowered into the trench by side-boom tractors. Bladed equipment or a specially designed backfilling machine would be used to backfill and compact the trench to the approximate ground surface elevation. This generally consists of replacing the material excavated from the trench. In areas where topsoil has been segregated, subsoil would be replaced first, and topsoil would be spread uniformly on top. Directly above the pipeline, an excess of soil or “crown” would be placed to allow for future settling. Construction debris, including wooden supports, welding rods, containers, brush, trees, or refuse of any kind, would not be permitted in the backfill. If an excessive amount of rocks are present in the backfill, the pipeline would be protected with rock shielding or similar protective coating and/or backfilled with clean padding prior to backfilling with the rocky material.

B.10.7. Hydrostatic Testing

After backfilling, the pipeline would be hydrostatically tested in accordance with regulations of the Office of Pipeline Safety, Pipeline and Hazardous Materials Safety Administration (PHMSA) within the DOT to ensure that the system is capable of operating at the design pressure. The testing process would involve filling a segment of the pipeline with water and maintaining a prescribed pressure for a specified amount of time.

The length of individual test segments would be determined by topography and water availability. Water withdrawals used to fill and test the pipelines would be consistent with applicable regulations and the EPP. Vantage would obtain hydrostatic test water from major waterbodies crossed by the pipeline and/or

municipal or private sources along the pipeline route. Adequate flow would be maintained in surface water sources to protect aquatic life and allow for downstream uses. The test water would be discharged through energy dissipation devices to the ground surface or to a nearby waterbody. These discharges would be done in accordance with the EPP and permits issued by applicable agencies.

B.11. RECLAMATION

B.11.1. Cleanup

After the backfilling is completed, Vantage would regrade and restore work areas as nearly as practicable to the original contour of the land. Topsoil would be redistributed over areas from which it was originally removed. Permanent soil stabilization efforts would primarily include revegetation of the right-of-way. Fences removed to install the pipelines would be reconstructed across the right-of-way. A detailed description of this process is provided in Section 4 of the EPP.

B.11.2. Restoration and Revegetation

Following installation and final cleanup, original grade and contours would be restored to the extent practicable and permanent erosion controls would be installed. Disturbed areas would be revegetated in accordance with Section 4 of the EPP, other permit requirements, and site-specific landowner requests.

B.12. LANDOWNERS

B.12.1. Notification of Affected Landowners

Vantage has acquired right-of-way required for the construction and operation of the Vantage Pipeline by negotiating easements with landowners along the pipeline route. Vantage has negotiated permanent easements that would grant the company the right to construct, operate, and maintain the pipeline in the permanent right-of-way. Vantage has also negotiated temporary easements for additional workspace needed to construct the pipeline. The easements would also address any specified concerns or requests the landowner may have.

B.12.2. Compensation

Landowners would receive monetary compensation in return for granting easements, including compensation for temporary loss of use during construction, crop damages, and the restoration of unavoidable damage to property during construction.

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